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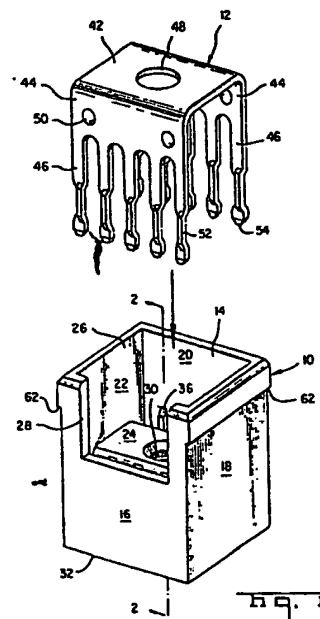
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(54) Power distribution block.

(57) The present invention relates to a device for supplying a large amount of electrical power to a printed circuit board or the like. More particularly, the device includes an insulating housing having therein a stamped and formed power distribution frame and a removable cover. The frame includes a plurality of depending pins and a center section to which a power cable may be attached. The plurality of pins, positioned on opposing sides of the center section, extend downwardly through the housing for connection to a plurality of conductive traces on the printed circuit board. The cover snaps over the top of the housing to cover the power cable attachment site.



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POWER DISTRIBUTION BLOCK

This invention relates to means and devices for bringing electrical power to a printed circuit board.

U.S. Patent No. 4,219,251 discloses a power connector for bringing power to a printed circuit board. The connector comprises an insulating body through which a plurality of conductive pin contacts pass. The upper ends of the pin contacts are soldered to a conductive plate positioned on top of the insulating body. The lower ends of the pin contacts are adapted for insertion into the circuit board for electrical engagement therewith.

The conductive plate includes a threaded aperture so that a power lead may be coupled to the conductive plate and pin contacts by a screw.

The present invention is intended to provide a power distribution block of the above kind which is substantially simplified in that only two components, one stamped and formed, and the second molded, are required. Also, the cost of manufacture is greatly reduced. Further, assembly is substantially easier in that one component is simply inserted into the other. Such assembly lends itself to a semi or fully automatic operation with a subsequent reduction in per unit assembly cost.

The power distribution block of the present invention is characterized by having an insulating housing with a plurality of pin-receiving passages extending therethrough with the passages being arranged in two rows, with each row located adjacent opposing side walls and a conductive frame having a center section for receiving an electrical terminal and with a plurality of pins attached to two opposing sides thereof and extending perpendicularly therefrom, said frame being inserted into the frame with the pins passing through

the housing passages and depending therefrom for insertion into a printed circuit board or the like.

For a better understanding of the invention, reference will now be made by way of example to the accompanying drawings, in which:

FIGURE 1 is an exploded, perspective view showing the two principal components of the present invention;

FIGURE 2 is a sectioned, elevational view of the housing of Figure 1 taken along line 2-2 therein;

FIGURE 3 is a perspective view of a cover for the housing;

FIGURE 4 is a perspective view of the assembled principal components of Figure 1;

FIGURE 5 is a perspective view of the present invention showing utility;

FIGURE 6 is a section view taken along line 6-6 of Figure 5; and

FIGURE 7 is a section view taken along line 7-7 of Figure 6.

Figure 1 illustrates the principal components of the present invention which, when assembled, comprises a means to bring power to a printed circuit board. The components include housing 10 and a U-shaped frame 12.

Housing 10 is preferably molded from an insulating material marketed by General Electrical Company under the trademark VALOX 420SEO.

Housing 10, shown perspectively in Figure 1 and sectioned in Figure 2, includes a compartment 14 which is defined by the upper portions of side walls 16, 18, 20, 22 and a floor 24. Access to the compartment is through top opening 26 and side opening 28. In an alternative embodiment, the upper portions of the side walls are omitted

and floor 24 then is top surface 24 of housing 10.

The lower portion of the housing includes a centrally located, threaded bore 30 which extends downwardly from floor 24 to base 32. In lieu of threads, bore 30 could be provided with a captive nut or left without threads or a nut.

Further included in the housing are two channels 34 which are found between floor 24 and side walls 16 and 20. These channels extend downwardly for a predetermined distance to accommodate the skirts on frame 12.

A number of spaced-apart, vertically extending ribs 36, located on the inside surfaces of side walls 16 and 20 project into the channels.

Five passages 38 extend downwardly from floors 40 of each channel through the lower housing to open out on the face of base 32.

Frame 12 is preferably stamped and formed from a conductive material such as a copper alloyed with nickel and tin. Suitable plating such as nickel is recommended. The one piece frame includes a center section 42, two side skirts 44 and five spaced-apart pins 46 extending downwardly from each side skirt. As shown in the drawings, the frame is U-shaped.

Hole 48 is provided in the center section and two outwardly projecting bumps 50 are provided on each of the two skirts. The pins preferably include a friction fit section 52 such as is disclosed in U.S. Patent No. 4,186,982 and sold under the trademark ACTION PIN by AMP Incorporated. These sections are inserted into plated-through holes on a printed circuit board (Figure 7) for electrical contact therewith as well as for mechanical retention. The free ends 54 of the pins are preferably bevelled to facilitate

the insertion.

Hole 48 may be threaded also to be used with a housing 10 having a bore 30 without threads or a captive nut.

5 Figure 3 illustrates cover 56 which may be used with housing 10 to close top opening 26. The cover is inverted to show clips 58 on end walls 60. These clips cooperate with downwardly facing shoulders 62 (Figure 7) on side walls 18 and 22 on housing 10 to retain the cover thereon. Figure 7 shows this cooperation. Preferably the cover is molded from the same material as the housing. Further, it may be 10 hinged thereto (not shown) by an integral strap. No cover, of course, would be used with a housing not having the upper portions of side walls 16, 18, 20, and 22.

Figure 4 shows power distribution block 64 formed by 15 inserting frame 12 into housing 10. With reference also to Figure 6, center section 42 rests on floor 24 of compartment 14. Hole 48 is in alignment with threaded bore 30. Skirts 44 are positioned in channels 34 with pins 46 in passages 38. The free ends 54 and friction fit sections 52 extend 20 below the housing for insertion into plated through holes 66 in printed circuit board 68 (Figure 6). Bumps 50 on the skirts bear against ribs 36 to hold the frame securely in the housing.

Figure 5 illustrates the utility of power distribution 25 block 64. The block has been attached to printed circuit board 68 and power brought in through wire 70. Ring tongue terminal 72, crimped to the end of the wire in conventional fashion, is attached to frame 12 by means of threaded bolt 74 which is received and retained by threaded bore 30, or 30 alternately by a threaded hole 48, or a captive nut in bore 30. Power is distributed to the ten traces (reference numeral 76 in Figure 6) on board 68 through the ten pins 46

on the frame.

Figure 5 also shows how top opening 26 and pasrt of side opening 28 may be covered by cover 56.

5 The present invention may be subject to many modifications and changes without departing from the spirit or essential characteristics thereof. The present embodiment should therefore be considered in all respects as illustrative and not restrictive of the scope of the invention.

CLAIMS:

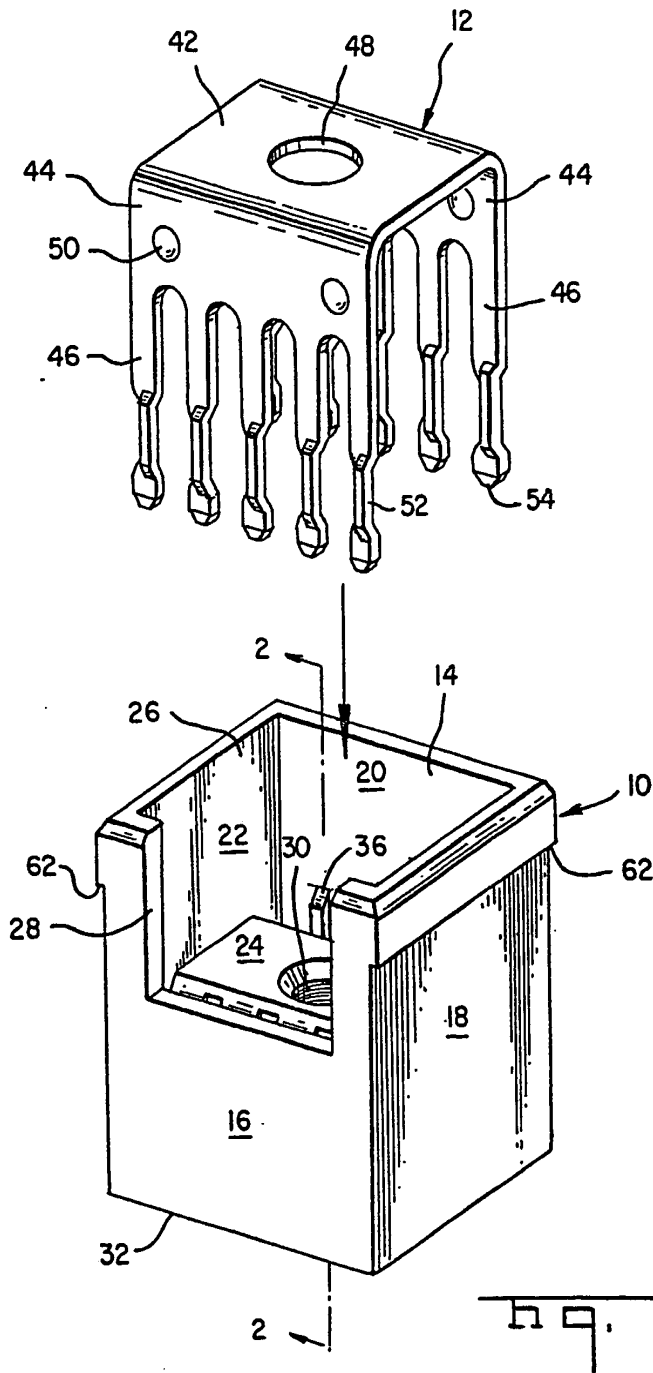
1. A power distribution block having an insulating housing (10) with a plurality of pin-receiving passages (38) extending therethrough from the top surface (24) to the base surface (32), characterized in that the passages (38) are arranged in two rows with each row being adjacent an opposing side wall and further a frame (12) of conductive material having a center section (42) and with a plurality of pins (46) on two opposing sides and extending perpendicular therefrom, said frame (12) being positioned in the housing (10) with the center section (42) positioned on the top surface (24) and the pins (46) passing through the passages (38) and from the housing (10) for insertion into a printed circuit board (68).

2. A power distribution block according to claim 1 characterized by enclosing the top surface (24) by side wall extensions (16, 18, 20, 22) with access means (28) thereinto and providing a cover (56) therefore.

3. A power distribution block according to claim 1 characterized by a depending skirt (44) on two opposing sides of the center section (42) and positioned intermediate the center section (42) and pins (46) and channels (34) in the housing (10) to receive the skirts (44).

4. A power distribution block according to claim 1 characterized by including electrical terminal receiving means (30, 48) for fastening the terminal end of a power line to the center section (42).

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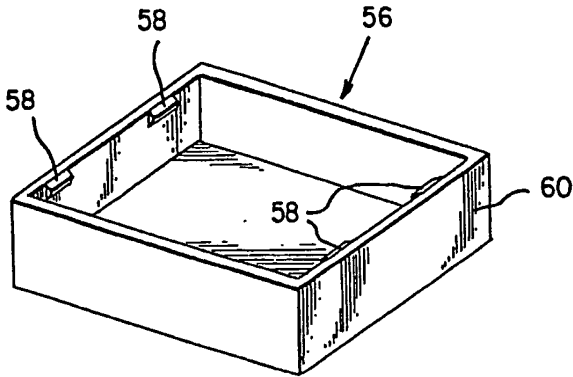
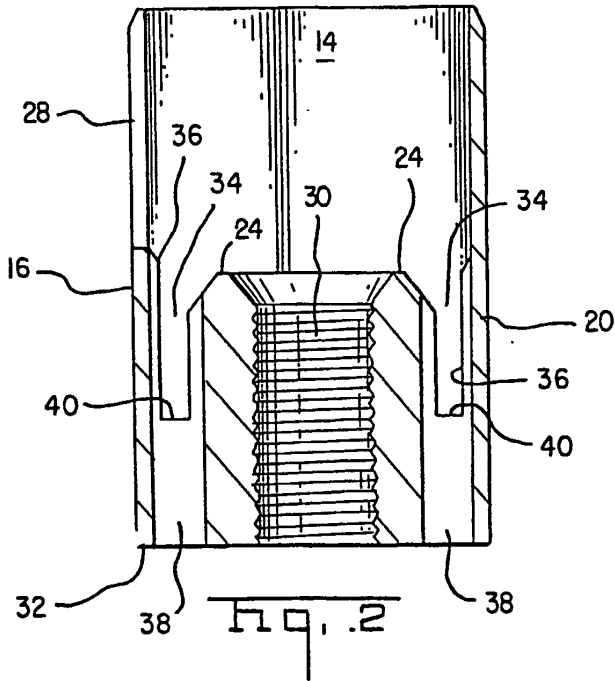


Fig. 4

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64

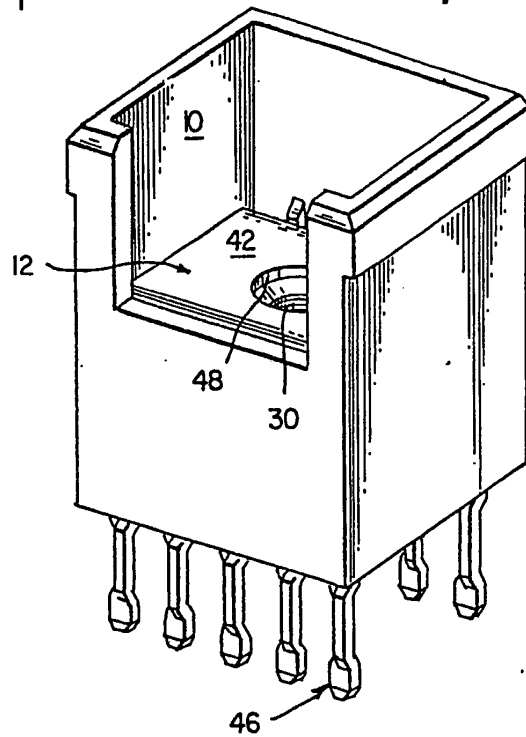


Fig. 5

